



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8**

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<http://www.epa.gov/region08>

Ref: 8EPR-SR

March 17, 2009

MEMORANDUM

SUBJECT: Libby OU3, Surface Water Toxicity Test, Selection of Water Concentration

FROM: Bonnie Lavelle
Remedial Project Manager

A handwritten signature in black ink, appearing to read "Bonnie Lavelle", is written over the printed name and title.

TO: Libby Asbestos Site OU3 Site File

The attached information was considered by EPA Region 8 in determining the high concentration of Libby Amphibole in water to use in the surface water toxicity test to be performed as part of the Phase III remedial investigation. The information consists of :

Attachment 1: email message from Remedium dated February 19, 2009

Attachment 2: working draft of "Hazard Quotient Risk Assessment Approach for Fish at OU3" prepared by SRC, risk assessment support contractor to EPA Region 8

Attachment 3: presentation of available Phase II data prepared by Parametrix, the laboratory selected by EPA Region 8 to perform the surface water toxicity test for OU3.

EPA Region 8 conducted a conference call on March 12, 2009 to discuss the attached information. Participants included Bonnie Lavelle, Region 8; Bill Brattin, SRC; Bob Marriam, Remedium; Sue Robinson and Joe Volosin, Parametrix.

Attachments



"Marriam, Robert R."
<Robert.R.Marriam@grace.com>

02/19/2009 01:48 PM

To Bonita Lavelle/EPR/R8/USEPA/US@EPA

cc "Medler, Robert J." <Robert.J.Medler@grace.com>

bcc

Subject Aquatic Toxicity Testing

Bonnie,

We have taken a look at the surface water analyses that have been completed along the Rainy Creek basin from URC-1 through LRC-6 including Tailings Pond and Mill Pond. There were 161 samples taken with an average LA content of 21.34 million fibers. This average includes the 1.2 billion fibers found in one sample in the Tailings Pond. We believe that 30 million fibers is an adequate and reasonable standard to be used in any aquatic toxicity testing. There is no reason to believe that an unreasonably high number should be used on the basis of what has been found in the water over a period of two years. Because fish do not exist in Fleetwood or Carney Creeks, the analyses from these sources were not included.

Robert R. Marriam, Consultant
Remedium Group, Inc.
6401 Poplar Ave., Suite 301
Memphis, TN 38119
901-820-2023 Office
901-277-9031 Cell

ATTACHMENT 1

HQ RISK ASSESSMENT APPROACH FOR FISH AT OU3

1.0 INTRODUCTION

Evaluation of risks to fish at Libby OU3 will be based on a evaluation of multiple lines of evidence. Assuming that it is possible to derive a reliable site-specific Toxicity Reference Value (TRV) for LA from a laboratory-based study of LA toxicity on rainbow trout fry, then this site-specific TRV may be used to help evaluate risks to fish based on measurements of LA concentration values in site waters. This is referred to as the “HQ approach”. The purpose of this document is to summarize the strategy that will be used to characterize risks to fish using the HQ approach.

2.0 CONCEPTUAL MODEL

2.1 Time Variability of Concentration

Figure 1 summarizes available data on the concentration of LA in surface waters at OU3. Flow data are also available for a number of stations.

Streams

Data from Phase II indicate that LA levels in surface waters of flowing streams in OU3 are not constant, but tend to increase during the spring runoff, although the magnitude and timing of the increases seem to vary between locations. The clearest examples are at LRC-1 and LRC-6. Therefore, the conceptual model is that maximum exposure in streams will generally occur during this time interval (late April to late June, at least for the 2008 calendar year).

Ponds

Concentration values in ponds follow a less clear temporal pattern, but the data suggest that levels in ponds (including the Tailings Impoundment, the Mill Pond, and Fleetwood Creek Pond) may also tend to increase somewhat during the spring runoff. The data suggest that the highest concentration values tend to be observed in the ponds, although the data are somewhat erratic and not all of the high values occur during the runoff.

2.2 Time Variability in Life Stage Susceptibility

Data are not yet sufficient to identify which life-stage of rainbow trout is most susceptible to effects of LA on mortality or growth of trout fry, but studies on many other chemicals indicate that small fish (generally in the early swim-up stage) are usually most susceptible. This life stage is generally present in the spring, approximately at the time of spring runoff.

2.3 Exposure Duration of Concern

The exposure duration of potential concern to trout fry is a key information item in planning the risk assessment strategy. At present, data are not yet available to determine the length of time that exposure of the most sensitive life stage (assumed to be fry) to LA must occur in order to cause adverse effects. It is considered possible that the results of the site-specific toxicity test may provide some information on this question. However, in the absence of information, EPA's AWQC program recommends that chronic TRVs be used to assess exposures that represent a 4-day average concentration. That is, the exposure duration of potential concern is 4 days, and the exposure metrics of concern consists of the series of 4-day average values that occur during the time interval that fry are present in the site waters.

3.0 HQ APPROACH

Based on the conceptual model above, the strategy that will be used to evaluate risks to fish by the HQ approach is as follows:

Step 1: Characterize Risks At Each Station

Stations

HQ values will be computed only for stations that are considered to be suitable as fish habitat. Calculations will not be performed for seeps or for any stations that dry up during the year, including:

- FC-1
- CC-1
- TP-Overflow
- FC-Pond

Concentration Values

As noted above, the preferred measures of exposure at each station would be a series of 4-day average exposure concentrations during the time interval that fry are present in site waters (approximately equal to the spring runoff period). Similar calculations may be performed for samples collected at other times of year, but it is likely the TRV (based on fry) will be overly conservative for the larger fish expected to be present during these other time intervals.

At present, data needed to calculate 4-day average concentrations have not been collected. This would require either collection of a time-weighted 4-day composite sample using an auto sampler, or else collection of a series of grab samples (e.g., 1-2 per day), followed by averaging of these values within a 4-day window. Rather, the data available are a series of grab samples collected on a time schedule of about 1-week intervals during runoff, and less frequently during the summer and fall. Consequently, in order to implement the HQ approach with the available data, it is necessary to assume that each grab sample provides an estimate of the 4-day average

concentration for the date at which the grab sample was collected. This approach might either overestimate or underestimate the true 4-day average concentration.

HQ Calculation and Display

An HQ value will be calculated for each grab sample (surrogate for a 4-day average) at each station. The results will be plotted on a graph showing the distribution of HQ values at the station. The data will also be listed in tabular format, with summary statistics showing the frequency and magnitude of HQ exceedences.

Figure 2 provides an example [using purely hypothetical data] of this type of display format.

Step 2: Characterize Risks in Large Exposure Units

EPA typically seeks to evaluate risks to ecological receptors at the population level. Therefore, the results from each station will be combined and displayed (using the same format as above) for a series of larger exposure units, each representing a potential population unit, as follows:

- Upper Rainy Creek
- Tailings Impoundment
- Mill Pond
- Lower Rainy Creek
- Fleetwood Creek
- Carney Creek

4.0 DATA INTERPRETATION

For this site, EPA is suggesting a strategy that is based on an assessment of the magnitude and frequency of HQ exceedences. This concept is illustrated in Figure 3. If exceedences are relative infrequent and relatively small in magnitude, then it is likely that population-level risks are low. If exceedences are frequent and large, then risks to the population (based on the HQ line of evidence) are of significant concern.

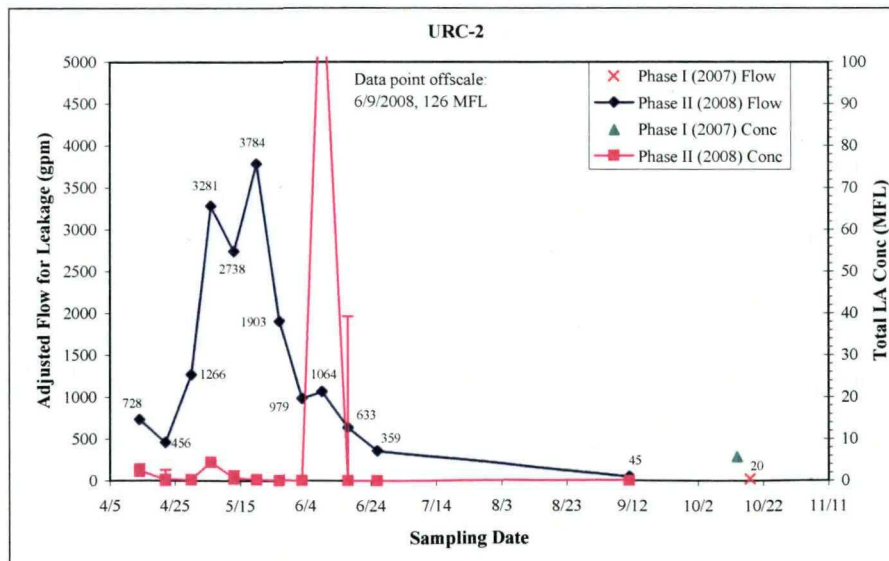
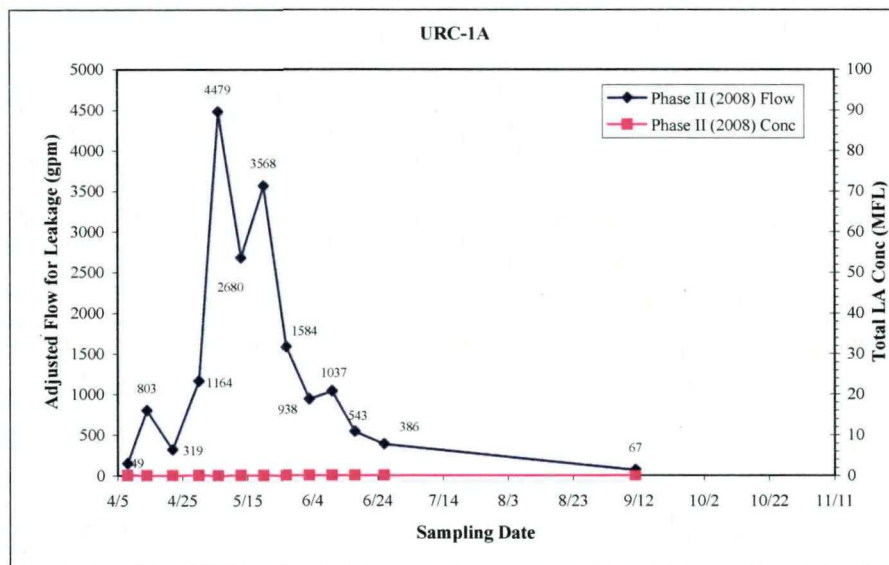
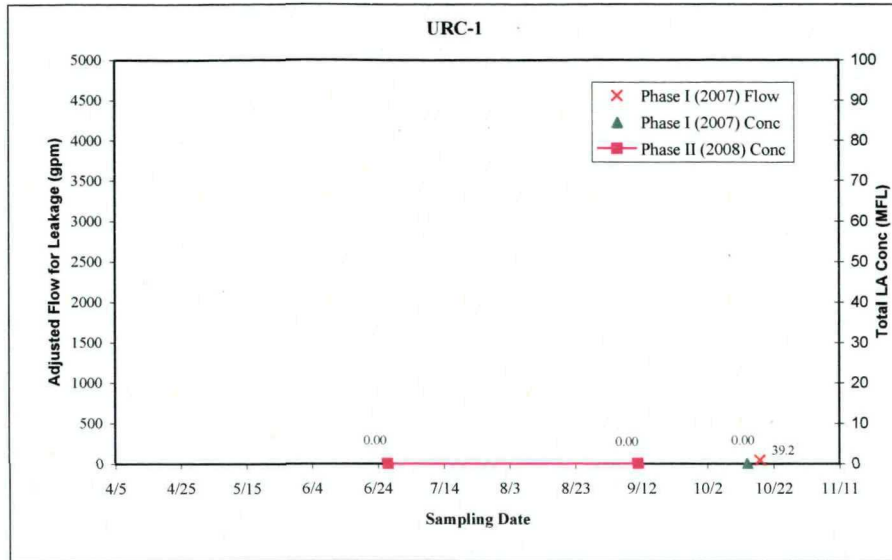
5.0 POTENTIAL FUTURE DATA NEEDS

Depending on the TRV value derived from the site-specific toxicity test, existing surface water data on LA may or may not require strengthening to support risk management decisions. For example, if the TRV is either well above or well below the majority of measured values, then additional data are unlikely to be needed. However, if the TRV is near the concentration levels that occur during the spring runoff, then it may be necessary to obtain additional measurements to help characterize the magnitude and frequency of any TRV exceedences. If such an effort is required, it may be appropriate to modify the sampling strategy in order to derive 4-day average values rather than assuming that a grab sample represents a 4-day average.

The potential need for any such additional data will be determined after the toxicity test is complete.

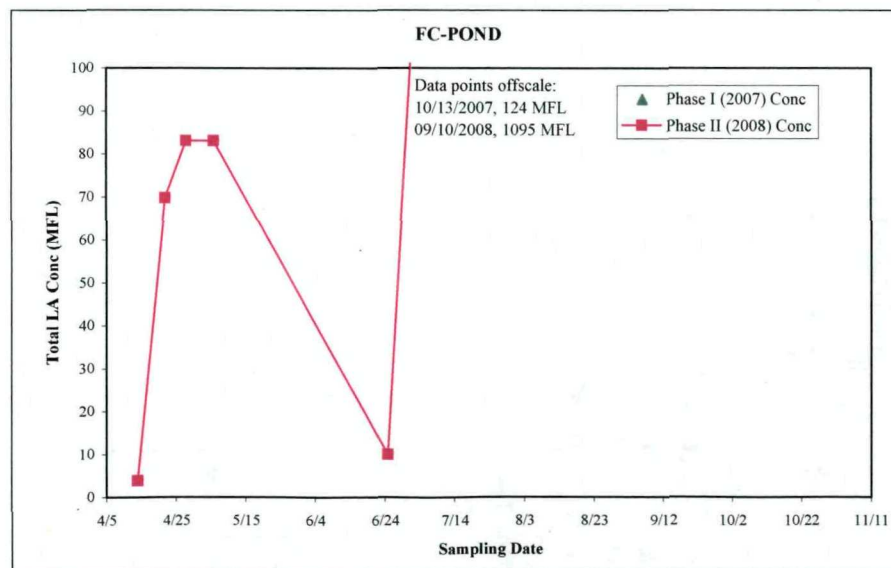
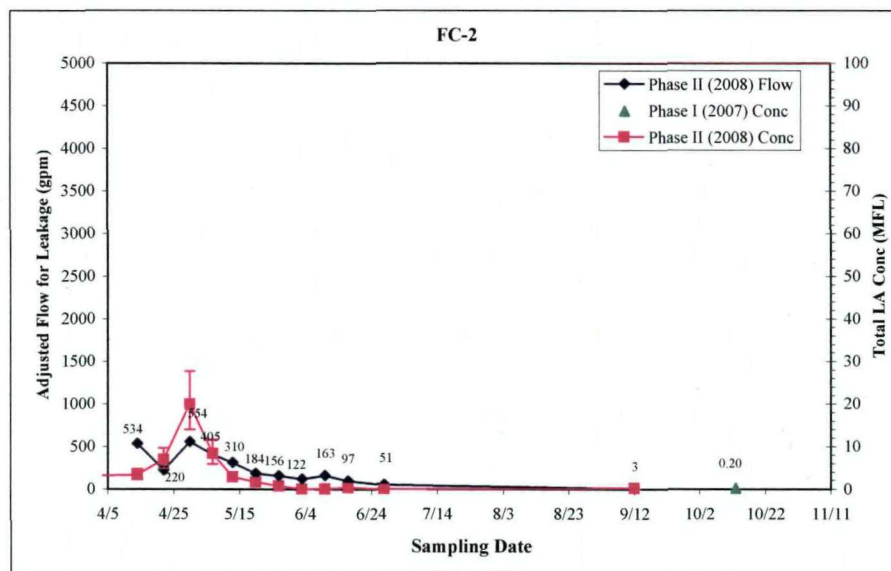
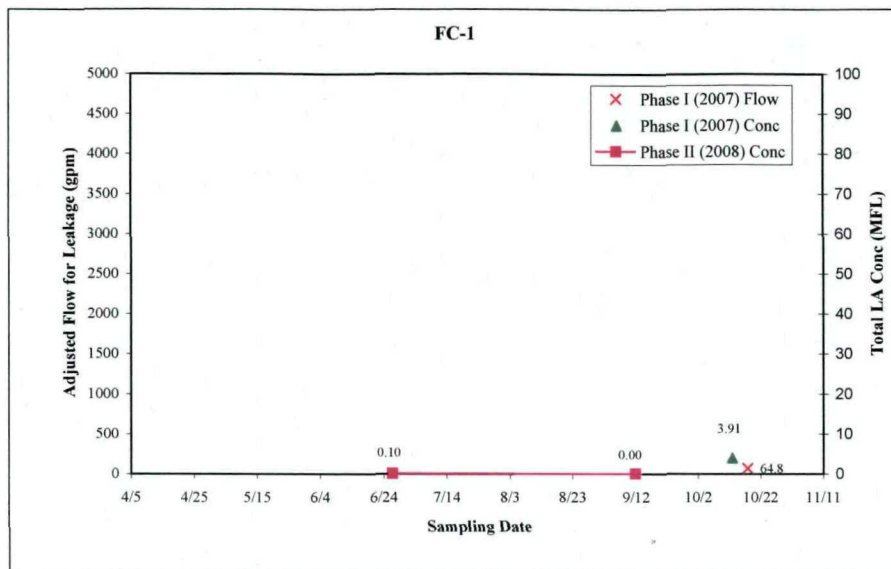
SURFACE WATER FLOW & LA, LIBBY OU3 PHASE I & II

UPPER RAINY CREEK



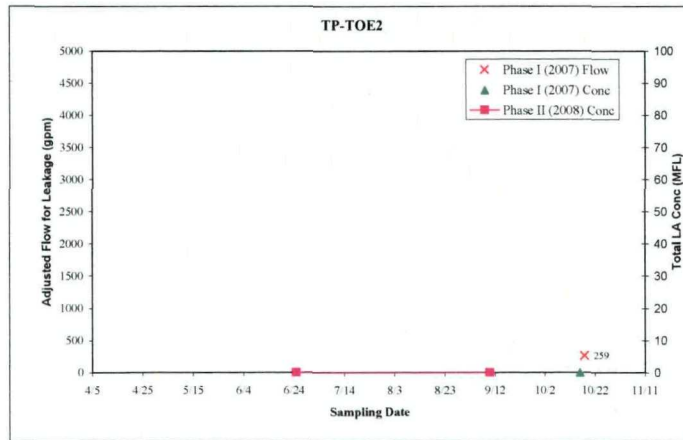
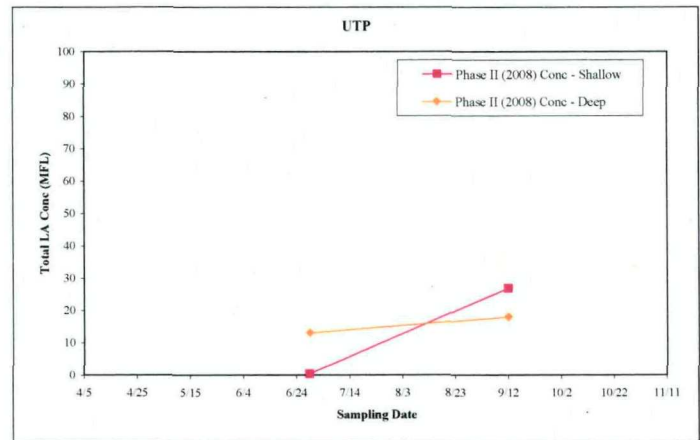
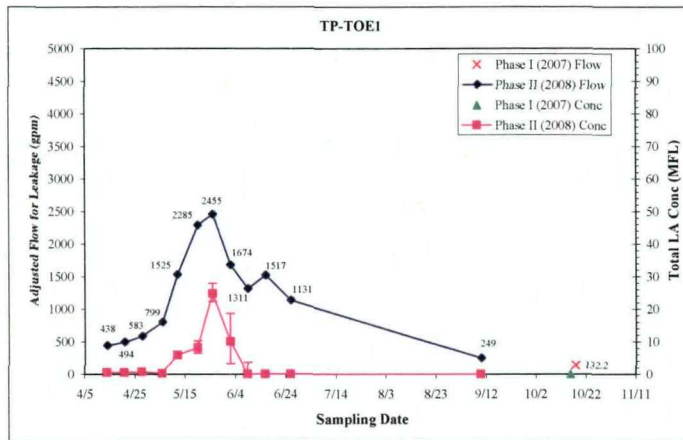
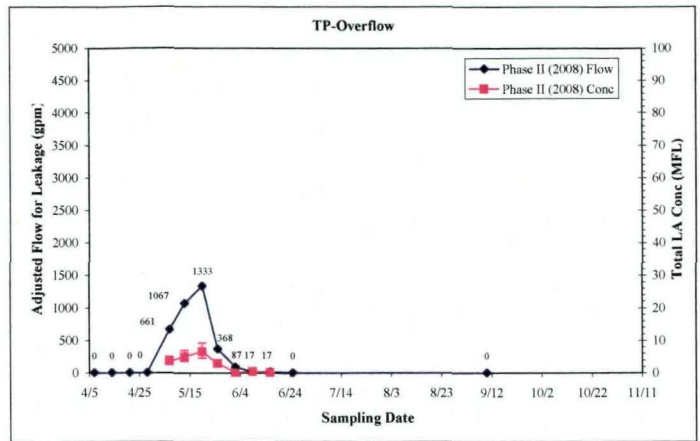
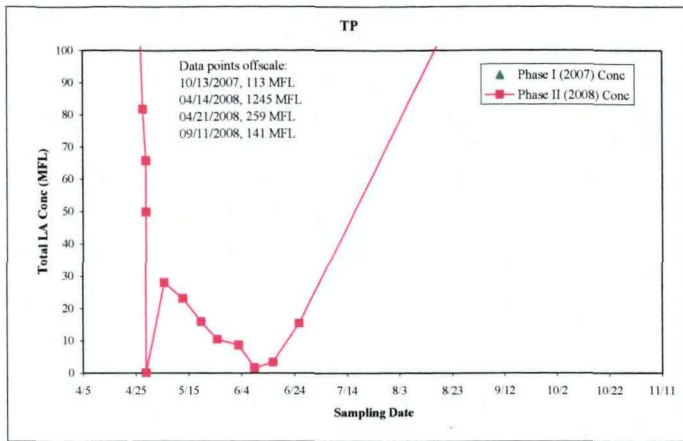
SURFACE WATER FLOW & LA, LIBBY OU3 PHASE I & II

FLEETWOOD CREEK



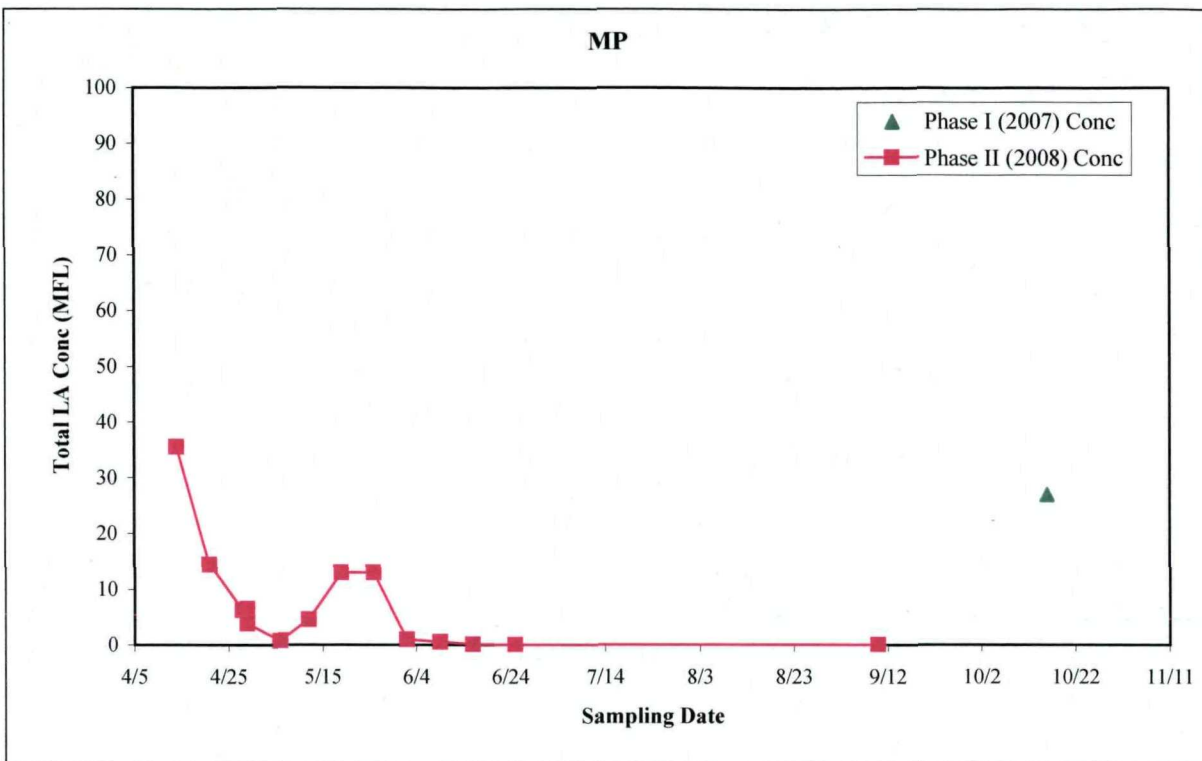
SURFACE WATER FLOW & LA, LIBBY OU3 PHASE I & II

TAILINGS IMPOUNDMENT



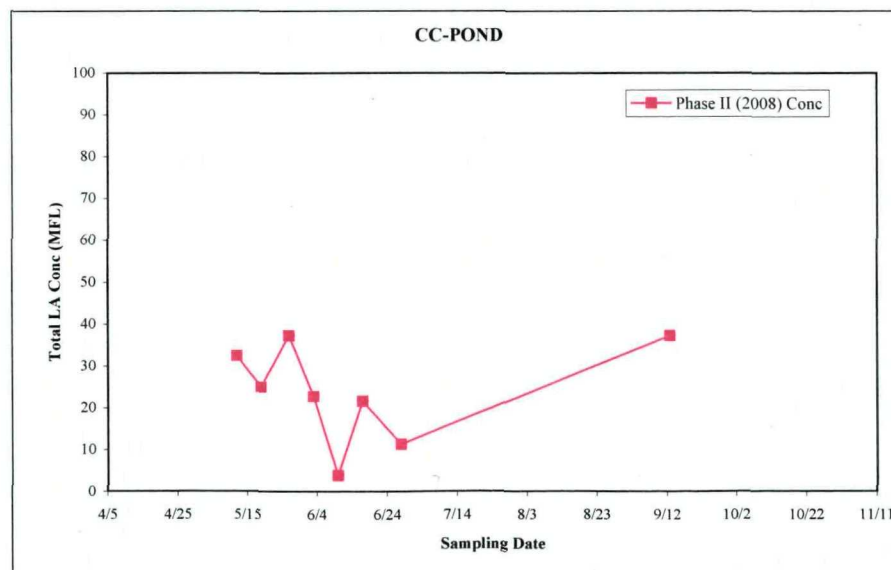
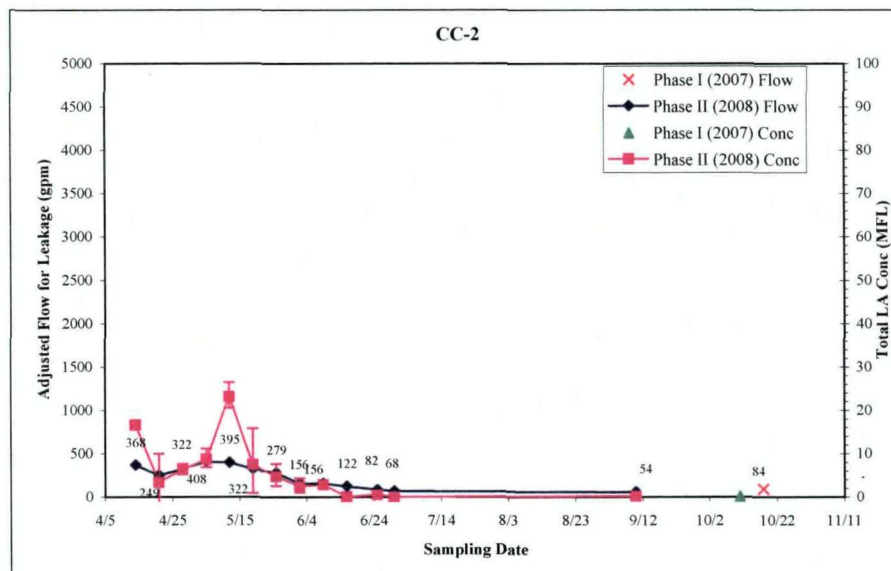
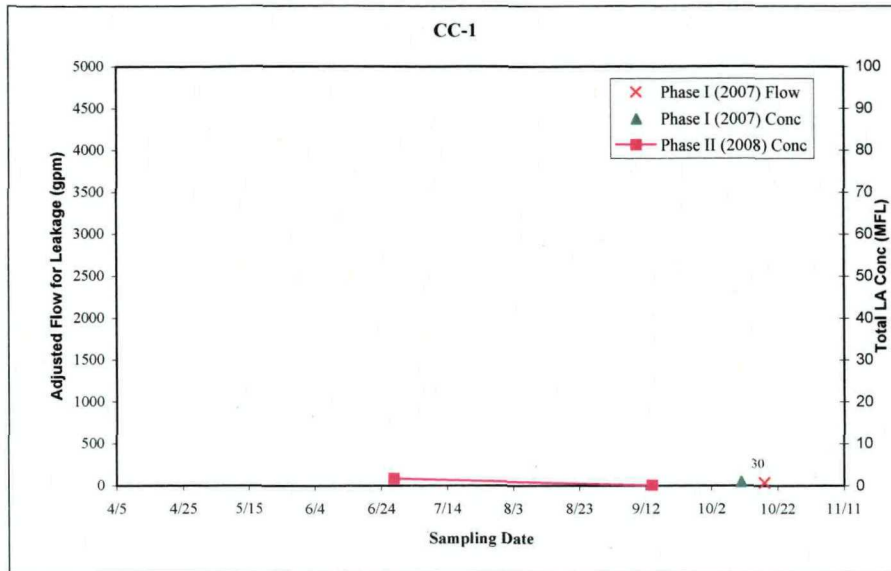
SURFACE WATER FLOW & LA, LIBBY OU3 PHASE I & II

MILL POND



SURFACE WATER FLOW & LA, LIBBY OU3 PHASE I & II

CARNEY CREEK



SURFACE WATER FLOW & LA, LIBBY OU3 PHASE I & II

LOWER RAINY CREEK

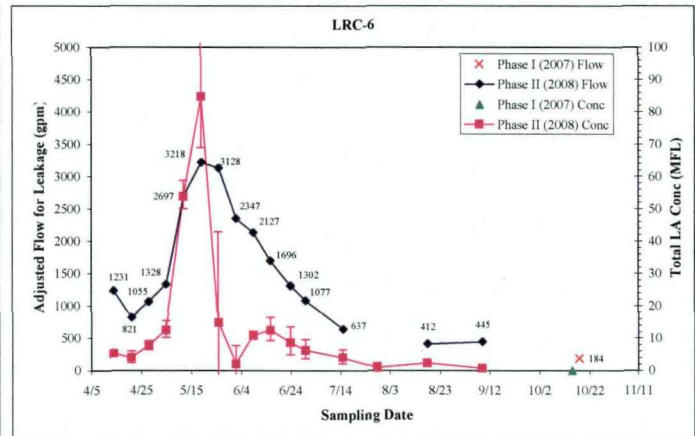
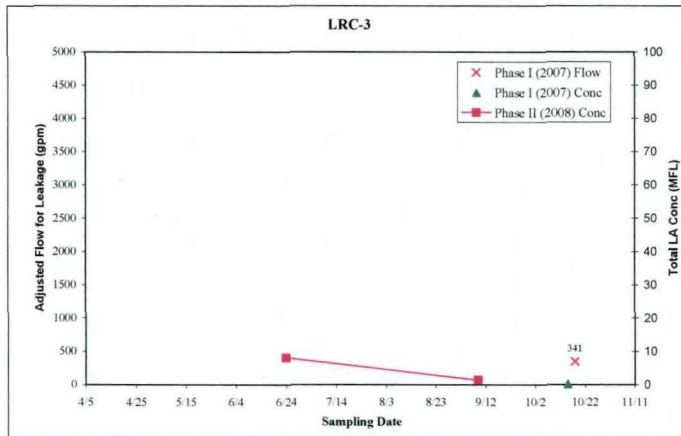
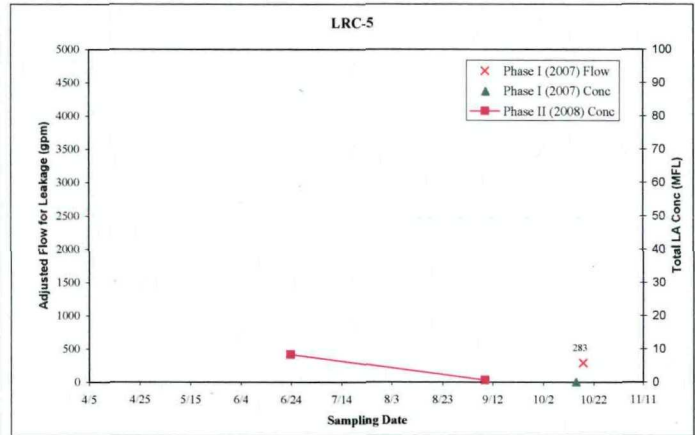
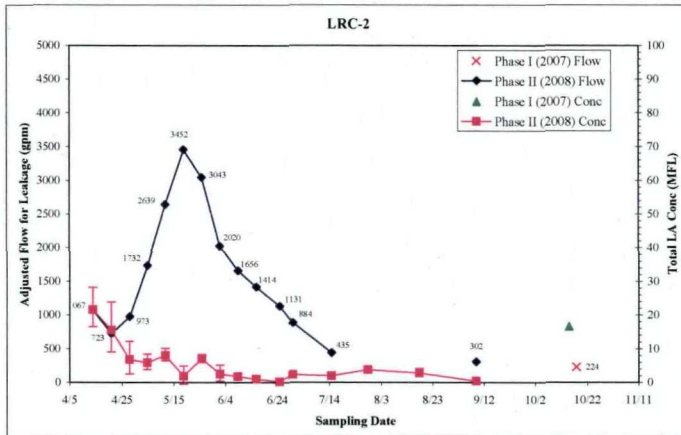
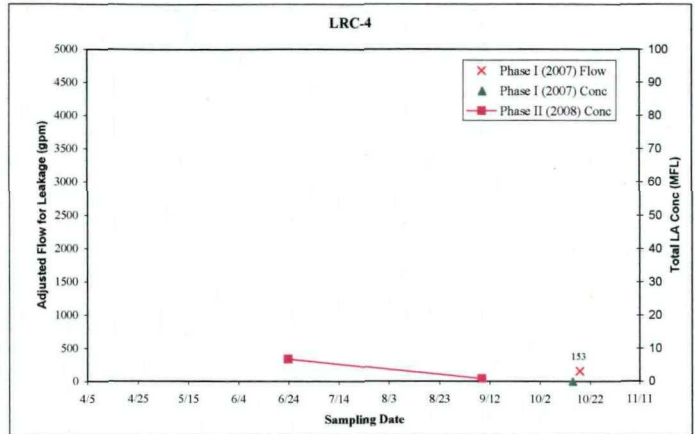
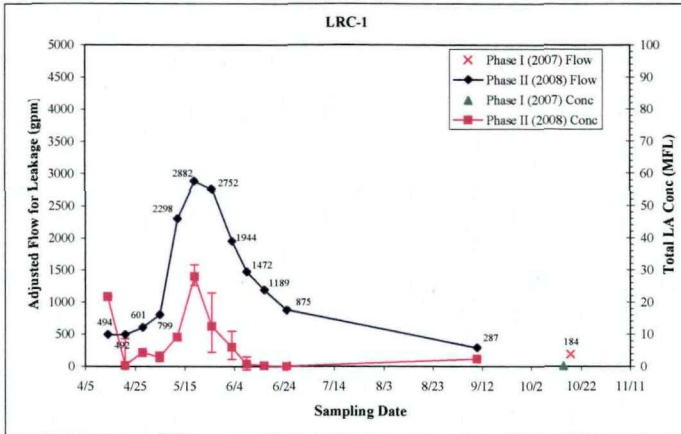
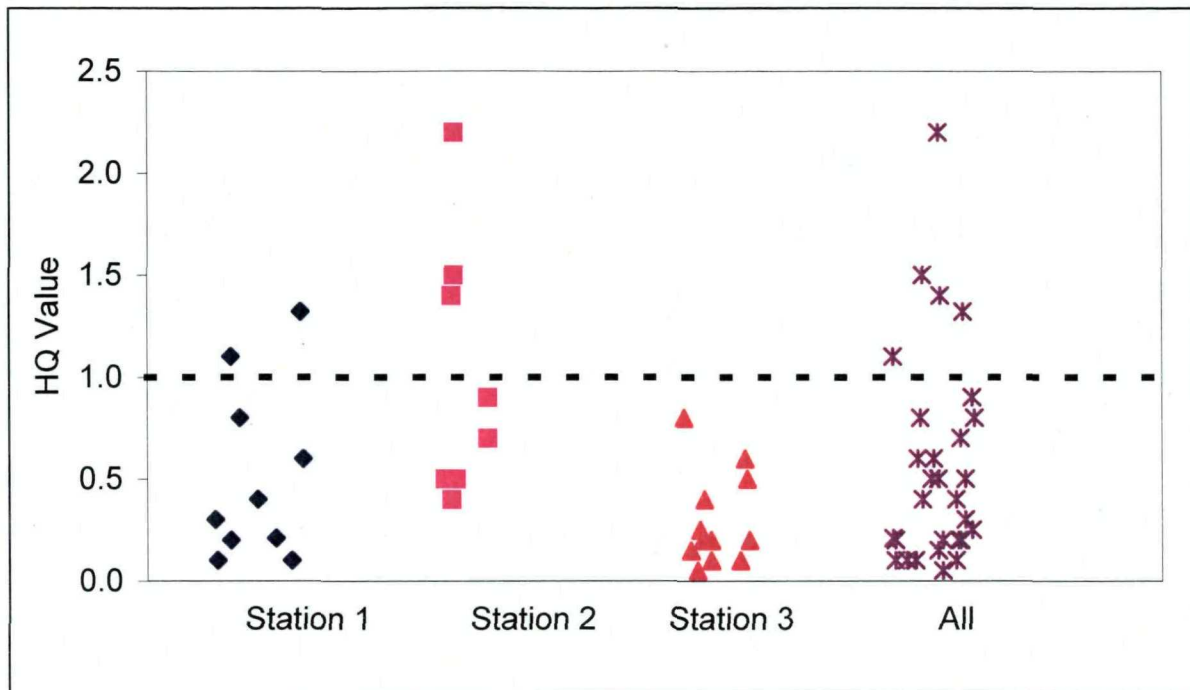
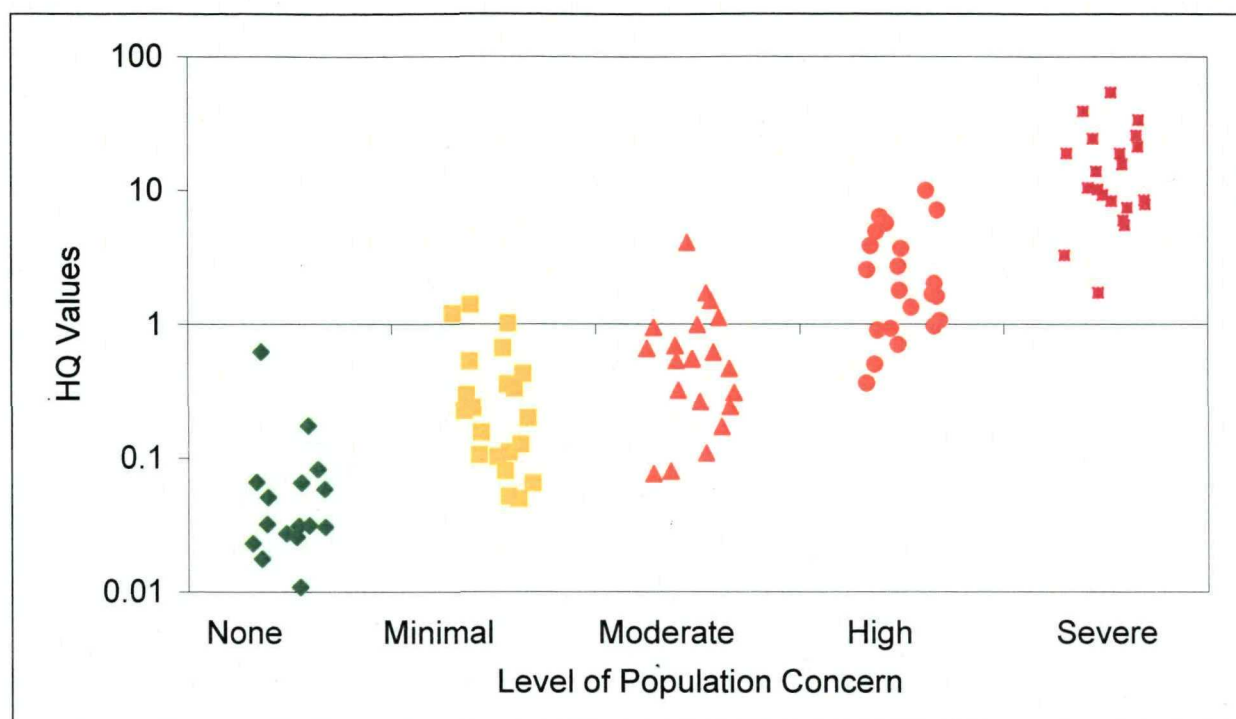


FIGURE 2 HYPOTHETICAL EXAMPLE

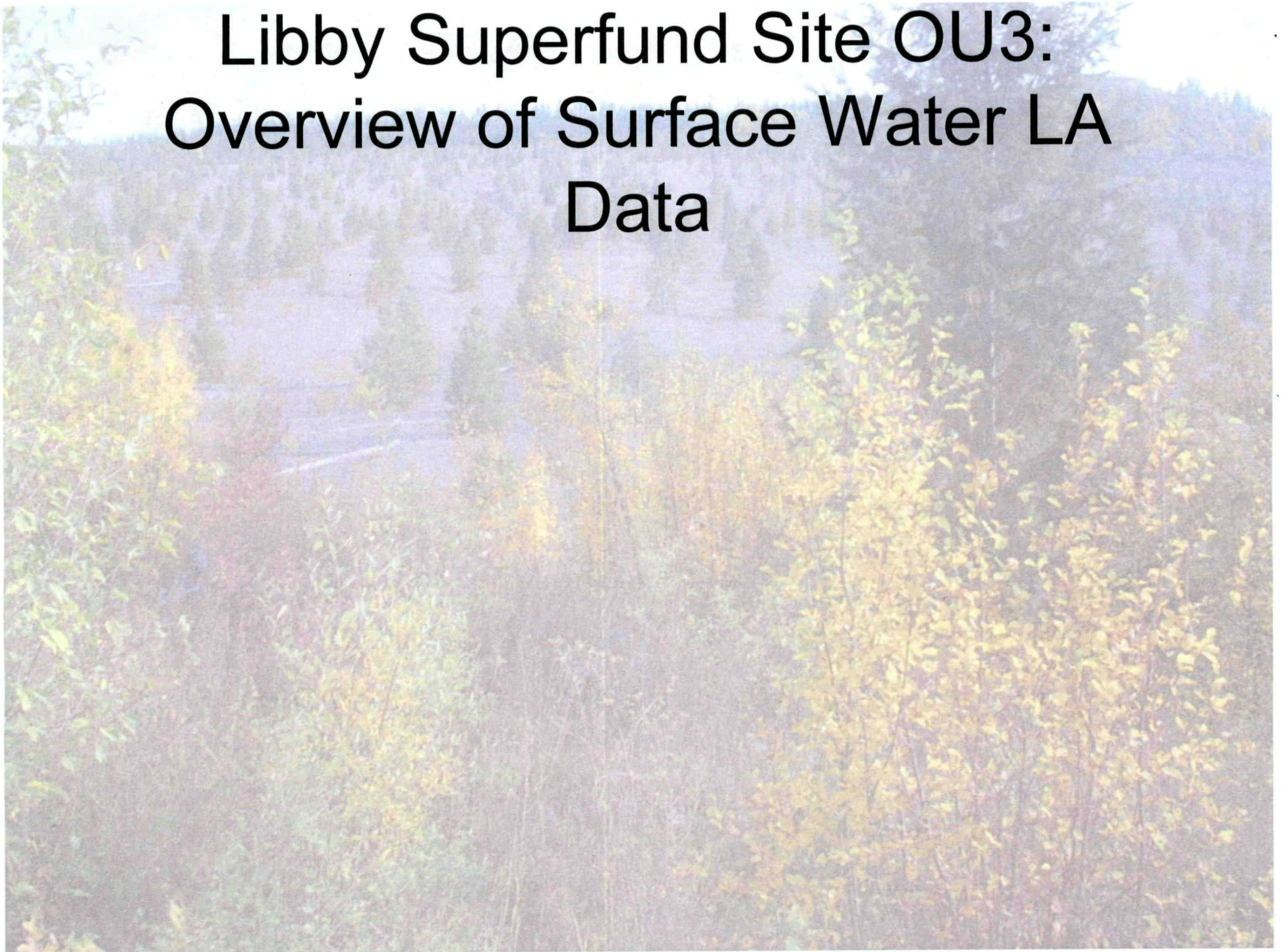


Station	N	HQ ≤ 1	$1 < \text{HQ} < 2$	HQ > 2
1	10	80%	20%	0%
2	8	63%	25%	13%
3	12	100%	0%	0%
All	30	83%	13%	3%

FIGURE 3 DATA INTERPRETATION



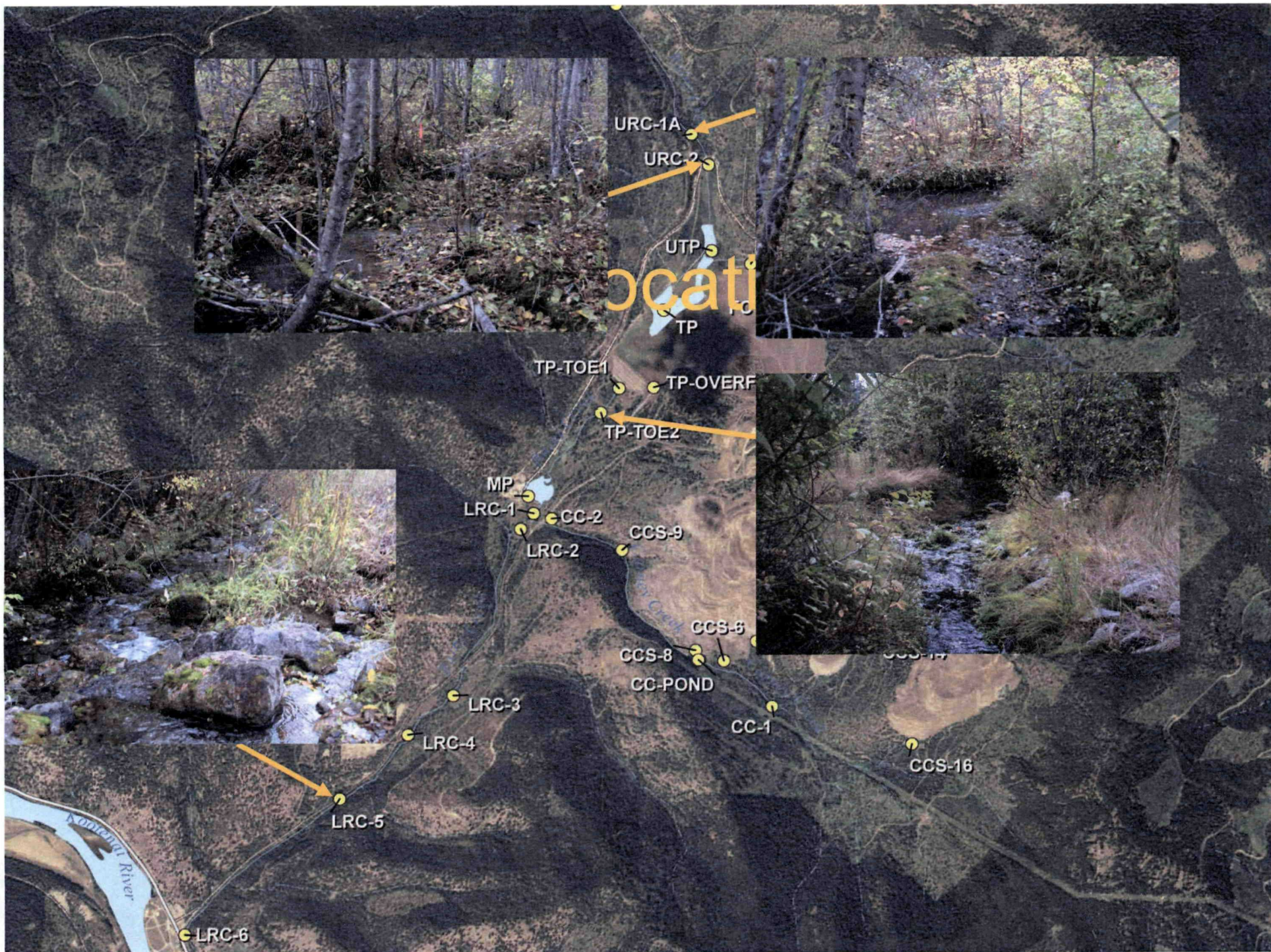
Libby Superfund Site OU3: Overview of Surface Water LA Data



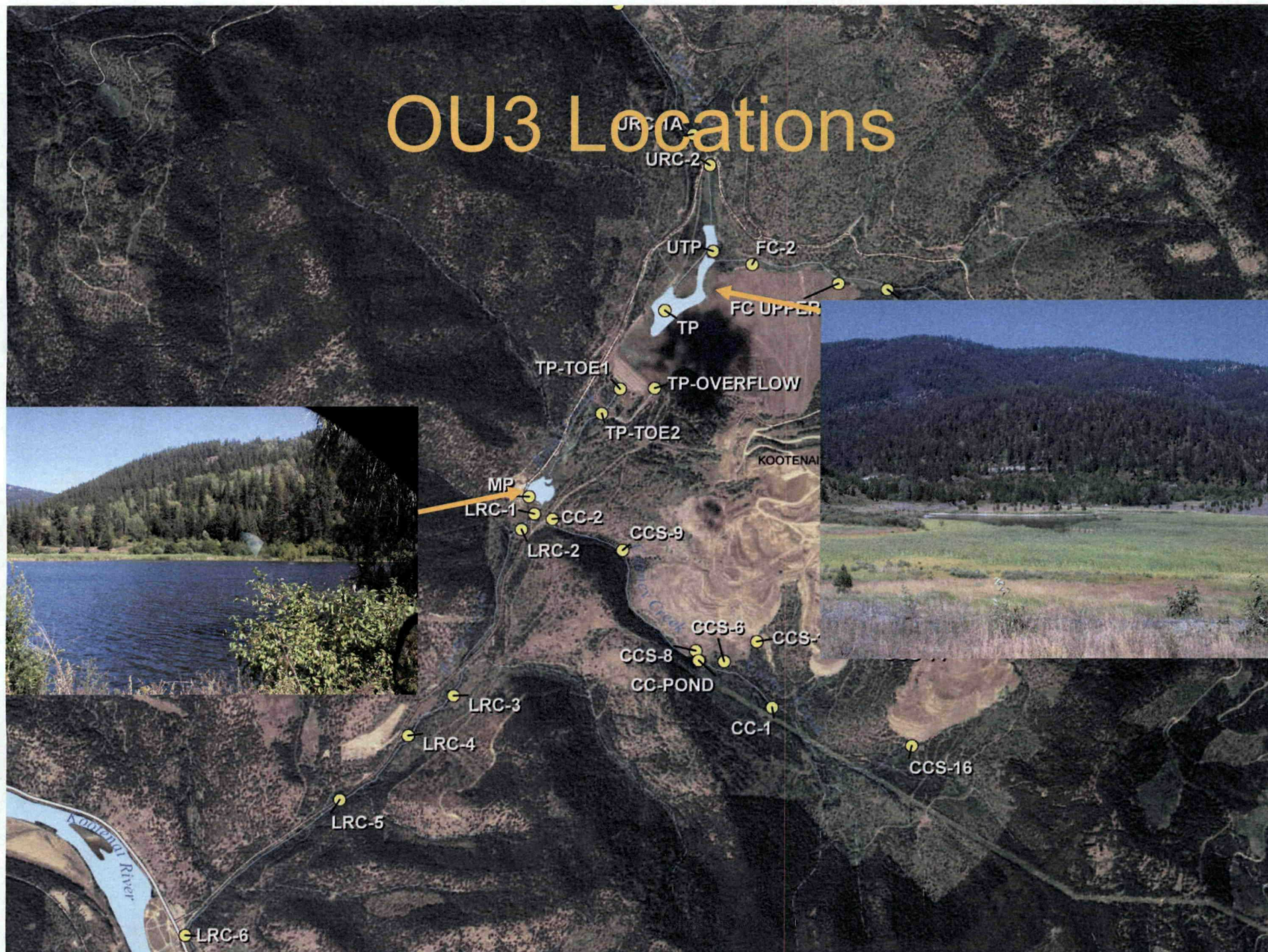


Presentation Overview

- Sites used for surface LA evaluation
- Method for surface LA evaluation
- Findings of surface LA evaluation



OU3 Locations





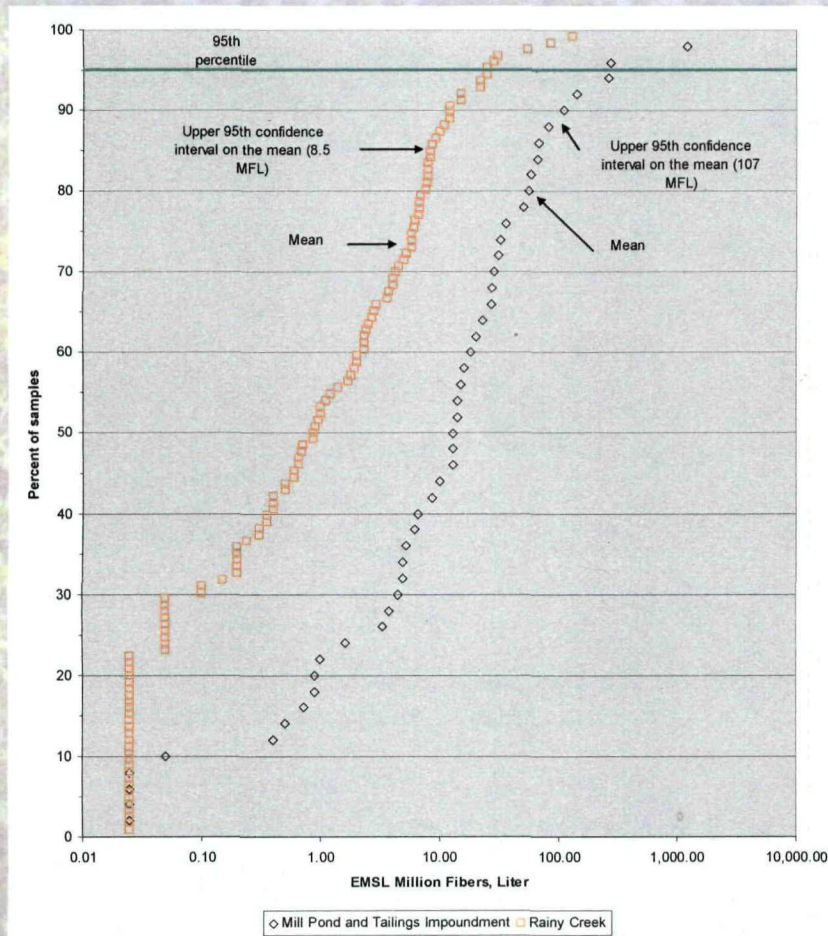
LA Surface Water Evaluation

- Surface evaluation approach
- Results for Surface Water LA by Area
- Results for Surface Water LA by Area and Season

LA Data Evaluation Methods

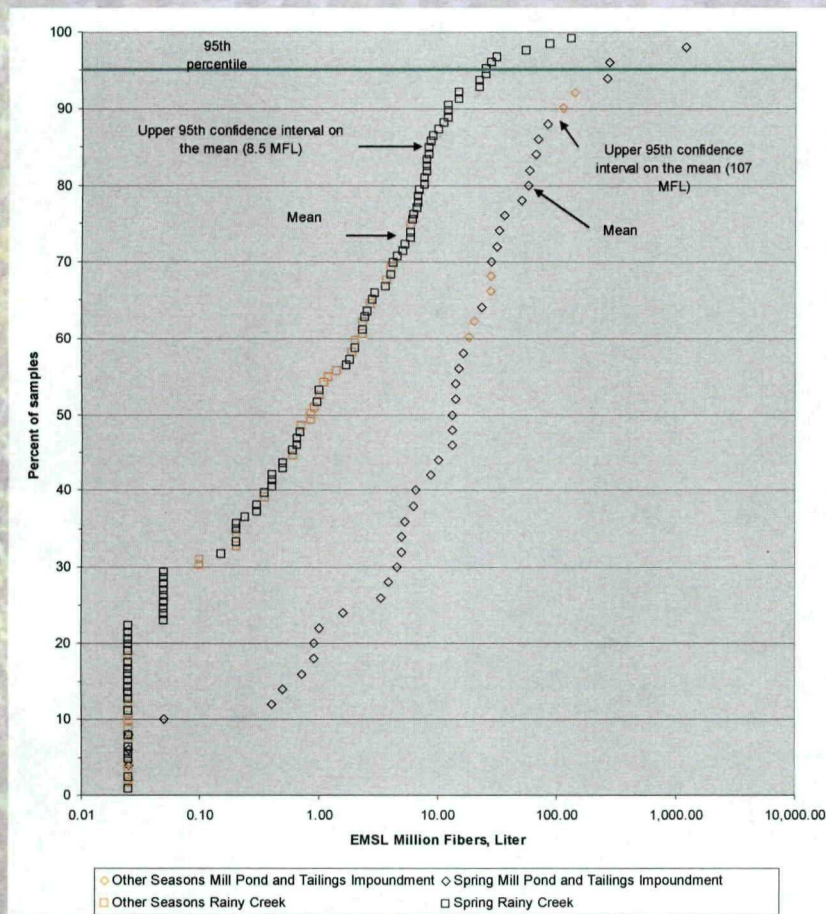
- Plotted stream and pond data separately in cumulative distribution functions (CDFs)
- Included "zero" values in each CDF. Assuming 25,000 fibers / L (0.025 million fibers/ L) for the zero values in the database
 - other data output, <0.05 million fibers/ L is often stated as the detection limit.
- Included Toe Pond Overflow with the Upper Rainy Creek data
- Dropped the results coded as field blanks (FB, were assumed to be field blanks).
- Calculated upper 95th percentiles of the mean

Surface Water LA by Pond and Stream



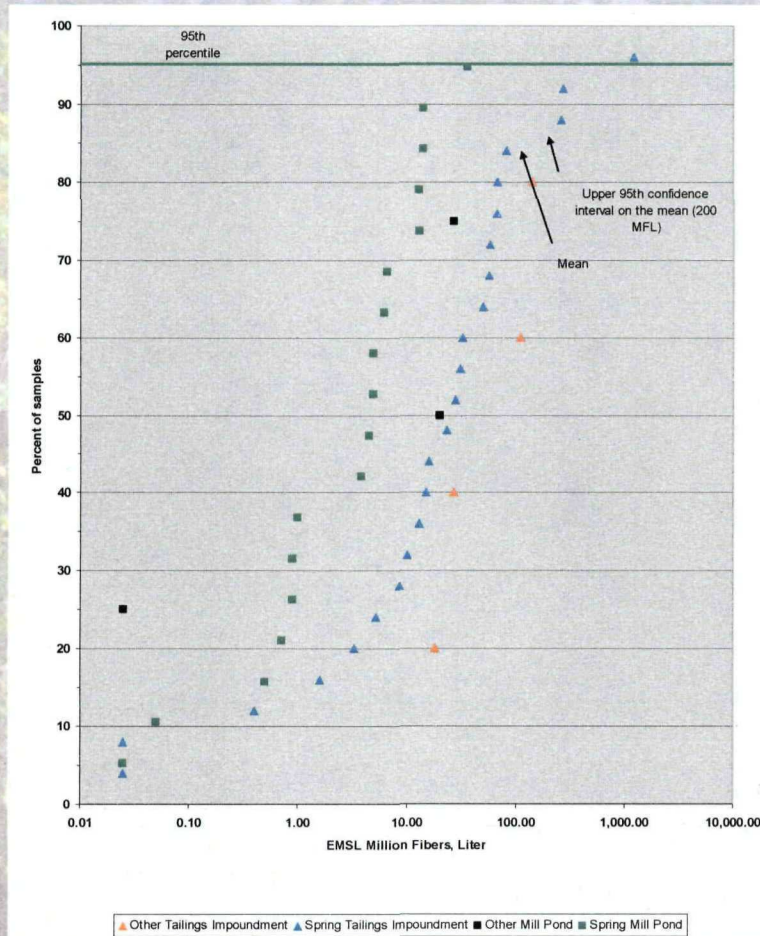
- For upper and lower Rainy Creek, there are no samples > 1.0 billion fibers per liter
- The frequency for > 1.0 billion fibers liter is, 1 out of 49 samples for the Mill pond and Tailings Impoundment data
- That sample was above the 95 percentile for the distribution when looking at both Tailings Impoundment and Mill Pond data

Surface Water LA by Pond and Stream and Season



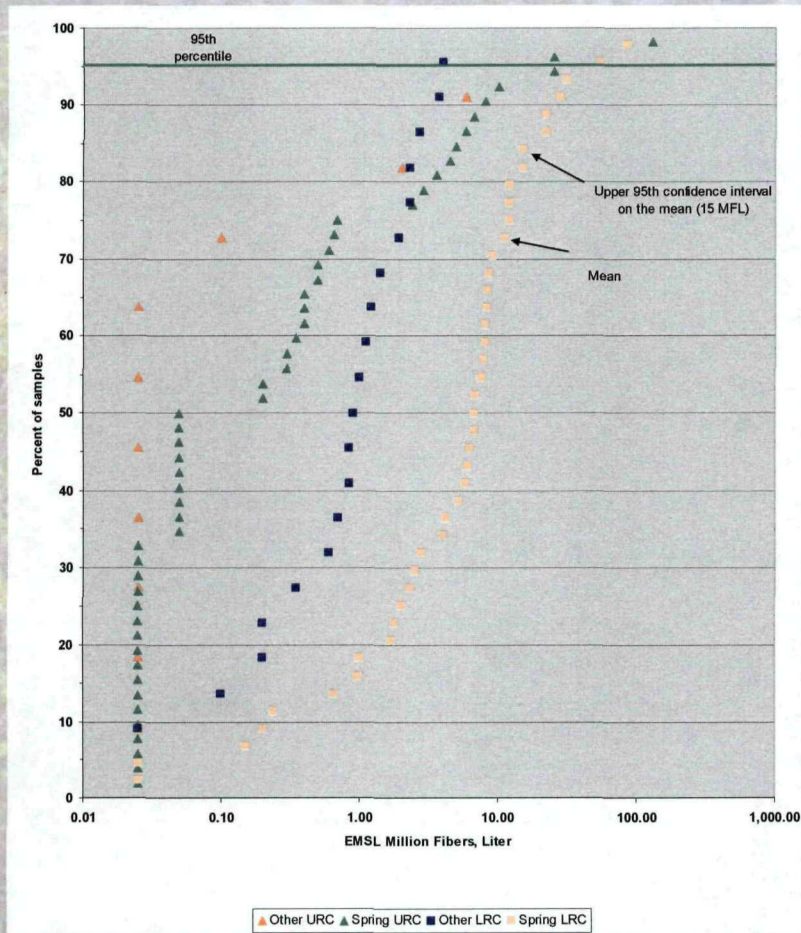
- April to June LA levels are higher for all Rainy Creek data than in other months
- April to June LA levels generally higher for Tailings Impoundment and Mill Pond data as well

Surface Water LA by Pond and Season



- April to June LA levels are the highest for Tailings Impoundment

Surface Water LA by Stream and Season



- April to June LA levels are the highest for lower Rainy Creek

LA Surface Water Data Recap

- For upper and lower Rainy Creek, there are no samples > 1.0 billion fibers per liter
- The frequency for > 1.0 billion fibers liter is, 1 out of 49 samples for the Mill pond and Tailings Impoundment data
 - That sample was above the 95 percentile for the distribution
- April to June LA levels are the highest for Tailings Impoundment
- April to June LA levels are the highest for lower Rainy Creek

Recommendations

- Maximum LA level should be 100 Million fibers/ L







Bonita
Lavelle/EPR/R8/USEPA/US
03/10/2009 01:55 PM

To Robert.R.Marriam@grace.com, robert.j.medler@grace.com
cc
bcc
Subject Libby OU3 conf call

Dear Bob and Bob,

Since receiving comments on the draft Phase III SAP, EPA has been refining our approach to assessing risk to fish at OU3. This has become necessary since some of the data to be collected in the Phase III program will support the fish risk assessment. Comments on the draft SAP have caused us to focus on this aspect of the OU3 program. We prepared a draft document that describes the current thinking. I'd like to discuss this with you and Parametrix.

Attached please find the draft document:

   
Assessing Risks to Fish -OU3 v3a.pdf Figure 1.pdf Figure 2.pdf Figure 3.pdf

EPA and SRC are available for a conference call to discuss this on Thursday March 12, 2009 at 10:00 am mountain time.

conference call number is:

1-866-299-3188

code: 303-312-6579

Sincerely,

Bonnie Lavelle
Remedial Project Manager
Libby Asbestos Superfund Site, OU3
EPA Region 8
1595 Wynkoop Street
8EPR-SR
Denver, CO 80202-1129

(303) 312-6579
Fax (303) 312-7151

Bonita
Lavelle/EPR/R8/USEPA/US
03/10/2009 06:56 PM

To brattin@syrres.com, burris@syrres.com
cc
bcc
Subject Fw: LA Surface Water Evaluation, Presentation

for the call on Thursday.

I set it up for 10 am - my conference call number:
1-866-299-3188

Code: 303-312-6579.

I sent the "HQ Risk Assessment Approach for Fish at OU3" paper w/ figures to them.

thanks.

----- Forwarded by Bonita Lavelle/EPR/R8/USEPA/US on 03/10/2009 06:53 PM -----



"Medler, Robert J."
<Robert.J.Medler@grace.co
m>

03/10/2009 02:59 PM

To Bonita Lavelle/EPR/R8/USEPA/US@EPA
cc
Subject FW: LA Surface Water Evaluation, Presentation

Bonnie

For the OU3 conference Call Thursday @10 Mountain.

Bob

From: Sue Robinson [mailto:SRobinson@parametrix.com]
Sent: Tuesday, March 10, 2009 3:34 PM
To: Medler, Robert J.; Marriam, Robert R.
Cc: Bill Stubblefield; Joe Volosin; Sue Robinson
Subject: FW: LA Surface Water Evaluation, Presentation

Hi Bob and Bob

Attached is our PP presentation for Thursday's call. Please feel free to pass on to EPA.

Regards
Sue

From: Joe Volosin
Sent: Tuesday, March 10, 2009 12:51 PM
To: Sue Robinson; Bill Stubblefield
Cc: Bill Stubblefield
Subject: LA Surface Water Evaluation, Presentation

Sue, here is the presentation to hand off to the Bob's. Bill gave me a couple comments to incorporate which I did.

Look it over.

Cheers, Joe V.

Parametrix

inspired people – inspired solutions – making a difference

Joseph S. Volosin

Ecotoxicologist

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fax: 716.667.1425

cell: 716.984.5531

volosin@parametrix.com



LA Water Presentation_03102009.ppt